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CLASSIFICATION CONFIDEN [redacted]

COUNTRY Bulgaria REPORT NO. 25X1

TOPIC The Bulgarian Railroad System

EVALUATION [redacted] PLACE OBTAINED [redacted]

25X1 25X1

DATE OF CONTENT 1945 to December 1949

DATE OBTAINED DATE PREPARED 3 March 1950

REFERENCES

PAGES 12 ENCLOSURES (NO. & TYPE) 3 - 1 Map; 2 Photographs

REMARKS

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1. General

The Bulgarian railroads do not compare with the highly developed railroad systems of the Western and Central European states. The sparseness of the population, the economic backwardness of the country, and the mountainous terrain of Bulgaria are the main factors delaying the creation of a uniform, dense, and efficient

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Document No. 009
No Change in Class.
Auth.: HR 70-2
Date: 02/04/78
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railroad system which would meet modern requirements.

Numerous barren and rugged mountain ranges difficult of access force the railroads and highways to follow the rivers and the various rows of basins.

The structure of this sparse network of exclusively single-track lines is therefore shaped by the two East-West mountain barriers of the Balkan and Rhodope mountains, which reach elevations of more than 2,000 meters. The following three E-W transverse lines of the country run parallel to these mountain ranges:

a. The line to the important Black Sea port of Varna, running along the northern slopes of the Balkan Mts and the Danube valley, together with its feeder lines from Sofia and Vidin.

The spurs branching off from this northern transverse route to the Danube ports serve shipping on this river and traffic with Rumania. There are no railroad bridges (see para 3e (4)).

b. The important transit line from Western Europe via Sofia to Istanbul (the so-called Balkan and Simplon Express) following the valley of the Maritsa River. Two spurs branch off southward from this line. The western one, originating in Sofia and running along the valley of the Struma River, is still narrow-gauge in the last section before the Greek border. The eastern one, standard-gauge, ends on Bulgarian territory not far from the Greek border.

c. The third East-West line, which is to establish a direct connection between the capital of the country and Burgas, the second important Black Sea port, is still under construction. The line was almost completed in late 1949. The gap between Klissura and Dolno Kamarce, a stretch of about 50 kilometers, will probably be closed during 1950. This will require extensive tunneling work in a difficult mountain region.

Three lines cross the Balkan Mts in a N-S direction, thus establishing connections between the E-W trunk lines. A fourth such line is under construction; it was put into operation as far as Trojan in January 1949. Its continuation to Karlovo will require some time because of a number of long tunnels which will have to be built. The efficiency of these N-S connections and thus their value in the economy of the country is adversely affected by steep grades, narrow curves, and numerous manmade structures.

Generally, standard European trains composed of 110 axles and with a length of 550 meters can operate only on the important transit lines; the other lines will take only shorter trains. The backward status of the railroad stations makes loading operations difficult and hinders a smooth flow of traffic. Many military posts are still without rail connections.

To these factors, characterizing the deficiencies in the Bulgarian railroad system, must be added a severe central European climate which leads to the formation of ice and snow drifts in the mountainous parts of the country, and to floods during the melting of the snow or after heavy rains in the plains crossed by uncontrolled rivers. The mountainous character of the country makes rail operations more difficult and expensive. The maintenance of the railroad installations as well as the execution of repair and improvement work (steep grades, narrow curves, numerous tunnels and bridges is also complicated. In spite of these difficulties there has always been a definite desire for improvement of the Bulgarian railroad net - an attitude which is reflected in numerous sizable results and in plans for future constructions. (For details see para 4).

2. Organization and Personnel

The Bulgarian railroads are state-owned. The few private railroad lines, which had existed in the country up to the end of World War II, were nationalized in recent years in accordance with the procedure pursued in people's democracies. The "Directorate General for Railroads and Ports," a department of the Ministry of Traffic, is the agency in charge of railroad operations, maintenance and improvement work, and administration. It executes its functions through the three "Railroad Inspectorates" in Sofia, Plovdiv, and Gorna Orekhovitsa.

The entire railroad system is modelled after the German pattern and is characterized by efficient supervision, good discipline and a fine sense of duty on the side of the railroad personnel, and by overall efficiency, which is higher than the average standard prevailing in the Balkans. The Soviet influence, although not conspicuous, makes itself felt and is a considerable power.

In late 1948 the railroad personnel was composed as follows:

491	officials assigned to the Directorate General;
5,962	engineers and workers assigned to the improvement and maintenance of lines;
6,623	engineers and workers employed in railroad factories and workshops;
319	auxiliary personnel.

Although, as is natural under a Communist regime, the leading railroad personnel were selected primarily for party affiliations and party standing, the bulk of the personnel owe their positions to their technical training and ability. The technical training of prospective railroad officials is therefore given the most serious attention.

3. Railroad Net

a. The Bulgarian railroad system had a length of 2,971 km standard-gauge and 419 km narrow-gauge in 1939. The rail network amounted to about 3,600 km standard-gauge and 450 km

narrow-gauge in early 1949. Of this mileage two-thirds had a gauge of 760 mm, the remainder 600 mm. The small increase in the narrow-gauge trackage is due to the fact that new lines are generally constructed as standard-gauge, apart from the fact that previous narrow-gauge lines are being converted to standard-gauge. The Bulgarian railroad lines are single-tracked for a 10-kilometer stretch of the Sofia-Voluyak line section, which is double tracked. As mentioned in para 1, the three E-W transverse routes, of which the third one is still under construction, and the four N-S lines (the fourth is not yet completed), form the backbone of the Bulgarian railroad system. All the other lines are of minor importance and, with regard to their capacities, do not compare with western European RR lines. The railroad net is relatively dense around Sofia, a fact which is due to the rapid growth of the capital as well as to the extensive brown coal deposits in the district of Rosino-Pernik and the production of anthracite near Dvogje.

b. The superstructure is laid on a pebble layer 3 meters wide and 35 centimeters thick. This ballast, although inferior to that used in western countries, is better than the sand ballast used in the other countries of the Balkan Peninsula.

Rails are generally laid on wooden ties of 2.5 x 0.25 x 0.16 m. Iron ties have been used on the following line sections:

Sofia - Pernik,
Sofia - Roman, and
Sofia - Belovo.

c. Due to the mountainous character of the country the Bulgarian railroad lines have many tunnels, bridges, fills, cuts, etc. There are approximately 80 tunnels and about 1,500 bridges, mostly steel structures. Steep grades and narrow curves make the use of long trains impossible and considerably reduce the capacity of the lines. Standard trains operate only on the large transit lines. Compared with other countries, the war damage to Bulgarian railroad lines and bridges was small and was repaired shortly after the war.

d. In spite of an ample reservoir of unexploited water power, electrified railroad lines are not yet available. The five-year plan envisages the electrification of only 150 kilometers, the first priority being given to the 90-kilometer stretch of the Sofia-Mezdra line, which serves as a feeder line to the northern E-W transverse route. The overhead network of this line has been under construction since May 1949. The construction of the required transformer stations and the other installations may be assumed to be completed in 1950.

e. Border crossing stations:

Most of the few border crossing lines serving transit traffic into the neighboring countries are inefficient.

(1) Bulgaria is connected with Yugoslavia by only one single-track line, which is of major importance as it is the route of the Simplon and Balkan express which connects western Europe and Istambul. The border station is Tsaribrod. Work on two other lines

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into Yugoslav-Macedonia, which was occupied by Bulgaria between 1941 and 1944, was started but discontinued after the war due to the changed political situation and the tension between these two states (see para 4 n).

(2) There is only a narrow-gauge line (600 mm) into Greece. On Greek territory this joins a standard-gauge line running parallel to the Aegean coast. Bulgaria, which had occupied this coastal area (Greek Macedonia) during World War II, tried to improve this line as a through standard-gauge route.

The politcal situation after the war led to a suspension of this construction project. The standard-gauge line now terminates at the railroad station of "General Todorov" on Bulgarian territory, the rest of the line to the Greek frontier is still narrow-gauge (see para 4 k).

For the same reason work was also suspended on the continuation of the line running south from Momcilgrad. This line, which was to reach the Aegean coast, now terminates near Podkova, Bulgaria (see para 4 l).

(3) Bulgaria is connected with Turkey by an important transit line running from Sofia along the Maritsa valley. Although single-track it is of relatively great efficiency. Svilengrad is the Bulgarian border station.

(4) Neither rail nor road bridges span the Danube River on the stretch of about 450 kilometers which forms the Bulgarian-Rumanian frontier, although numerous branch lines lead to the Danube ports on both sides of the river. This condition requires the construction of one or more rail bridges, particularly in the interest of the Soviets, to whom such bridges would be of paramount importance in the event of military operations in the Balkans. Necessary plans were completed many years ago, but they have not yet materialized beyond solemn promises, preparatory measures, and test borings at possible bridge sites. As during the period of the German occupation, these delaying tactics are chiefly pursued by the Rumanians, who fear that the construction of a bridge over the Danube would unilaterally favor the Bulgarian ports of Varna and Burgas to the detriment of their Black Sea port of Constantsa. It is surprising that the Soviets have not exerted more pressure to gain their objective, but for the time being political considerations seem to take precedence over their vital interest in better communications in that region.

Possible sites for a Danube bridge are at:

Vidin - Calafat
Gigen - (Boril-Corabia), Somovit (Nikopol - Turnu Magurele)
Svistov - Simnicea, and Ruse - Giurgiu

the latter named site is the best suited of them all. At present rail operations between Bulgaria and Rumania are maintained:

(aa) By means of a rail ferry between Giurgiu and Ruse. Ferrying

operations which are maintained by the Bulgarian ferry Sofia (see Annex 2), are wearisome and embarrassing. The boat has a loading surface of 65 x 15 m, is equipped with three tracks, and is propelled by two Diesel engines of 670 HP each. It attains a speed of 15 kmph. With a capacity of 12 freight cars and one hour required for a round trip, including loading and unloading operations, the ferry has a capacity of 4 or 5 trains per day in round-the-clock-operations. This corresponds to the performance actually reached during the period of the German occupation. This crossing would represent a great and vulnerable bottleneck in the event of warlike operations in the Balkans.

(bb) A second and direct rail connection between the two countries exists along the Black Sea coast. The Bulgarian customs station on this line is Dobric, but the line is operated by the Bulgars as far as Kardam in Rumania. The basic weakness of this line lies in the fact that it is single-tracked and that a bridge system several kilometers long was required to cross the swampy Danube River banks between Fetesti and Cernavoda.

The ferry connection established by the Germans between Vidin in Bulgaria and Calafat in Rumania, with a daily capacity of 4 or 5 trains, is no longer in operation. The reason for its suspension is unknown. Presumably, the ferry was destroyed during the war and a replacement is not available.

4. Postwar Construction Projects:

In spite of the difficult terrain and the financial plight of the country, every Bulgarian government, regardless of politics, has spent surprisingly large sums on the maintenance, improvement, and expansion of the Bulgarian railroad system. This tradition is continued by the present People's Democracy with a view of bringing the railroad system up to the requirements of the intended greater industrialization of the country. Apart from the losses suffered by the rolling stock the Bulgarian railroad installations survived the war fairly intact, so that the government is able to concentrate its efforts on the improvement of existent and the construction of new railroad installations. In many construction projects the Soviet influence is conspicuous. The way in which these projects are executed, particularly the "voluntary" participation of the youth and the entire population, is fashioned after the Soviet pattern. The result is a continuous modernization of the national railroad system which, after a successful execution of the envisaged five-year plan, will probably have overcome its present weakness. The supply of the required constuction materials, such as rails and bridge sections, seems to be guaranteed by imports from Czechoslovakia and from the Soviet Union.

In detail, the following postwar construction projects are either completed, under construction, or are at least planned:

(a) Makocevo-Gopot railroad line, (70 km) single-track, European-gauge. The line closes the previous gap in the middle (third) N-S transverse route, which on the one hand is to establish the shortest connection between Sofia and Burgas and Varna, and on the other is to ease the strain on the two other N-S lines. The difficult and precipitous terrain of the Balkan mountains makes the construction of this line a difficult enterprise. Four long tunnels are required. That at Koznica is now under construction and will presumably be the longest tunnel on the Balkans. From the east, the line had progressed as far as Klisura, 25 km west of Gopot, by early February 1949; from the west the line had reached Dolno Kamarze, 15 km east of Makocevo, by late September 1949. The completion of the entire line will require considerable time; it will eventually be of great importance for Soviet transit traffic.

(b) Lovec-Trojan railroad line (36 km), single-track, European-gauge, a section of the projected connection between North and South Bulgaria. The line was already under construction between 1929 and 1934, but work was then discontinued and was resumed only after the war. The line will gain real importance as a fourth N-S route only after the connection near Karlovo is established. The attainment of this objective is envisaged by the current five-year-plan. Already in the initial phase of construction, the crossing of the Balkan mountains confronted the railroad engineers with considerable difficulties. The Lovec-Trojan section, on which scheduled rail operations were started on 10 January 1949, has 10 major bridges, 4 tunnels, the longest of which is 340 m long, and numerous high retaining walls. Youth brigades and the civilian population were employed to a large extent for the construction of the line.

The section as far as Karlovo which awaits completion will probably offer still greater terrain difficulties and require even longer tunnels. Its completion may therefore be expected only in a number of years.

(c) Vratza-Orjahova railroad line (100 km)
This line, which is to establish a more efficient connection to the Danube port of Orjahovo, is under construction as a single-track European-gauge line. Its completion is scheduled for 1950.

The project is to be executed in two stages:

(1) Construction of a line from Vratsa to Bjala Slatina (50 km), where it joins an existing narrow-gauge line,

(2) Conversion of the existing Bjala Slatina 760 mm gauge line to European-gauge (50 km).

It may be expected that after completion of this project the remaining narrow-gauge Bjala Slatina-Cerven Brjag line will also be converted to European gauge.

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This line is of primarily economic importance.

(d) Cerven Brjag-Stavertse-Boril railroad line (70 km); a single-track European-gauge line, under construction since the spring of 1949. It runs along the Iskor valley to the Danube River and is scheduled to establish a new connection with shipping on the Danube River. Nothing is known on the scheduled date of completion. This line may gain special importance in connection with the possible construction of a rail bridge near Gigen (Boril-Corabia) (see para 3 e(4))

Somovit-Nikopol railroad line (10 km), the extension of an existing single-track European-gauge line along the Danube River to the important inland harbor of Nikopol. The line was completed shortly after the war.

(e) Samuli-Silistra railroad line (115 km), under construction as a single-track European-gauge line to the easternmost Bulgarian Danube port of Silistra, which still is without rail connection. The Samuil-Isperih section (40 km) was completed in mid-May 1949. The total line, which runs via Dulovo, is scheduled to be completed in 1950. It opens up a district poor in railroad lines and is of primarily economic importance.

(f) Pleven-Lovec railroad line (40 km), a projected single-track European-gauge line. The construction work has not yet started. This line would be of importance in connection with the project mentioned under (b) above as an extended N-S connection.

(g) Leskovets-Slataritsa railroad line (10 km), the extension of an existing single-track European-gauge line. It was constructed by "youth brigades" and completed in September 1949. It is of only local importance for the Gorna Orekhovitsa district.

(h) Sofia-Povoseltsi railroad line (20 km). This project envisages the construction of a second track, required to ease the traffic burden on the much used transit line in the area of Sofia.

So far the Sofia-Volujak section of this line, a stretch of 10 km, has been the only double-track line section in Bulgaria.

(i) Pernik-Volujak railroad line (52 km), a single-track European-gauge line which has been in operation since early 1949 serving purely industrial purposes. In the summer of 1949, this section was taken over by the Bulgarian State Railways. It establishes a rail connection with the important coal mines southwest of Sofia and at the same time it relieves the strain on the Sofia-Pernik railroad line. Due to mountainous territory it required the construction of 38 bridges and three tunnels one kilometer long each, a fact which considerably reduces the train density possible on this line.

(j) Dupnitsa-Mina Bovov Dol railroad line (30 km), conversion

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of the previous 600 mm gauge line to European-gauge. The project was completed by the Summer of 1949. The line is of economic importance for the coal mines around Bobov Dol.

(k) Simitli-Krupnik-General Todorov railroad line (60 km). Started in 1943, this line, running from Sofia to Greece, narrow-gauge (600 mm) from Simitli onward, was converted to European gauge. The project is completed as far as the railroad station of General Todorov. When Bulgaria, during World War II, occupied Greek Macedonia, it was planned to extend the European gauge line until it reached the European-gauge Aegean coastal line near Valovista. The project was discontinued because of the changed territorial conditions after the war and the political tension between Bulgaria and Greece. Thus the section of the line from General Todorov to the Greek border has remained narrow-gauge. For this reason there is still no European gauge line from Rumania and Bulgaria to the Aegean Sea except a single-track line running along the Turkish-Greek frontier via Edirne (Adrianople) - Pityon - Dede Agach.

(l) Momcilgrad-Podkova railroad line (18 km), the extension of an existent European-gauge line running south toward the Greek border. It was begun during the last war and is now completed as far as Podkova. The plan to continue it to Kalinkovo, in Greece, where it would have joined the Aegean coastal line, has been discarded for the same reason as project (k) above. In its present form, the incomplete line does not have the desired importance as a feeder line to the Aegean Sea. Militarily, it is, however, of value as a border spur in the district of the Rhodope Mts, which is poor in railroad facilities.

(m) Bansko-Dobriniste railroad line (10 km), extension of an existent 760 mm gauge line, completed in late 1947. The continuation of this narrow-gauge line is scheduled to run along the Mesta valley toward the Greek border as far as Nevrokop. The line is of equal military and economic importance in the western Rhodope district. It is also planned to join this line between Bansko and Simitli to the network of standard-gauge lines in the western part of the country. This project has not progressed beyond the planning stage.

(n) Plans for the construction of two new standard gauge railroad lines into Yugoslav Macedonia, which during the war was occupied by Bulgaria, have been discarded due to the changed situation after the war and the political tension between the two neighboring states, particularly after 1948.

The projects concerned were

(1) The Gjuesevo-Kumanovo - (Skoplje) and the
(2) Gorna Dzumaja-Kocani - (Veles) railroad lines.

Preparations for this project were under way during World War II.

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The two lines would have created additional urgently needed connections between the Bulgarian railroad net and the Yugoslav trunk line. The realization of this project will be unfeasible as long as the Tito-Cominform conflict continues.

5. Locomotives and Rolling Stock

a. In this field, Bulgaria suffered major losses in the first two postwar years. Under the pretext of confiscating railroad equipment left by the Germans, the Soviets in 1945/46 withdrew many Bulgarian locomotives and freight cars from the country. This created a bottleneck which it will be impossible to eliminate for years.

Stocks available in late 1948:

Locomotives, European gauge, 551, including:
43 fast locomotives,
163 passenger locomotives,
133 freight locomotives,
the remainder are small tank-locomotives.
115 narrow-gauge locomotives with gauges of 600 and 760 mm.

Railroad cars:

5,780 open freight cars of various types,
4,064 box freight cars,
469 passenger cars,
219 baggage and service cars.

The shortage of freight cars caused considerable difficulties in 1948, when the harvest products had to be shipped. According to an announcement by the State Railways, the car situation in 1949, mostly due to organizational reforms and not to increases of stock, improved to such an extent that adequate freight space could be made available.

b. With regard to these difficulties, the current five-year plan, terminating in 1953, envisages the procurement of:

87 locomotives, including 35 electric locomotives
120 passenger cars,
3,250 freight cars of all types
27 motor rail cars, and
30 coaches to be attached to motor rail cars.

Some of them are to be built domestically, some are to be imported, chiefly from Czechoslovakia.

c. Railroad industry:

In late 1948 the first Bulgarian locomotive was built at a cost of 15 million Leva in the newly constructed "Georgi Dimitroff" Locomotive and Railroad Car Factory in Sofia. Thus the foundation for a national railroad industry was laid.

The construction of 10 additional locomotives was begun in 1949.

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The following state-owned installations are available for new construction and repair work:

Locomotive Repair Shop in Sofia,
Locomotive Repair Shop in Ruse,
"Zdravina" Railroad Car Factory in Drenovo,
"Karalvag," a former Bulgarian Shareholding Company for building ships, locomotives, and railroad cars, in Varna,
Railroad car repair shop in Burgas, and
23 small repair shops in various towns, the most important of them being located in Pleven, Plovdiv, and Gorna Orekhovitsa.

6. Military Vulnerability of the Bulgarian Railroad Net

Soviet transit traffic and intra-Bulgarian rail operations can be effectively interrupted since the network of Bulgarian railroad lines is so loosely woven that there are almost no rerouting facilities in case a given line should be blocked.

a. Disruption of transit shipping:

The small number of rail crossings into neighboring states permits a sustained interruption of rail traffic through Bulgaria. Of the E-W transit routes, the important line from Yugoslavia to Turkey can easily be eliminated for a considerable time, since it is single-track and rerouting facilities are not available. Air attacks against the Sofia rail junction and against both the line and the bridges around Tsaribrod, the Yugoslav-Bulgarian border station, would block the only connection with Yugoslavia.

In its eastern section, this single-track line can be interrupted most effectively near the Greek-Turkish border by the destruction of the Maritsa bridge near Pityon (see attached photograph, Annex 3) and of the Arda bridge west of Edirne. Rerouting facilities do not exist there.

N-S transit operations can best be interrupted as follows:

To Greece by air attacks against the railroad station of General Todorov, which is of outstanding importance as the transloading point from European to narrow gauge on the only rail connection to the south.

To Rumania either by the sinking of the rail ferry operating between Ruse and Giurgiu or by the mining of this section of the Danube river. The second direct and single-track rail connection leads over a bridge system several kilometers long between Fetesti and Cernavoda in Rumania. The bridges can be destroyed with long-lasting effect either from the air or by partisans.

b. Paralyzing intra-Bulgarian rail operations:
The sparseness of the exclusively single-track railroad net hardly allows any rerouting possibilities in case of interruption of the most important lines. The lines have many bridges, often located in rough and rugged mountain areas with almost no roads, and for this reason difficult to repair. Their demolition is bound to have a long-lasting effect. If attacks

against the important rail bridges are combined with continuous air attacks against the few but decisive railroad junctions of Sofia, Mezdra, Plovdiv, Gorna Orekhovitsa, Bindel, and Karnobat, the Bulgarian railroad system can be effectively paralyzed.

5 Annexes: (1) Map of the Bulgarian Railroad Net, Status of December 1949

(2) Photograph of the Rail Ferry "Sofia." Operating between Ruse and Giurgiu.

(3) Photograph of the Bridge over the Maritsa River near Pityon (Turkish border).